TECHNOLOGY NEEDS/OPPORTUNITIES STATEMENT
FIELD SCREENING FOR HAZARDOUS MATERIALS FOR
THE 105-D AND 105-H REACTORS

Identification No.: RL-DD033
Date: August 2001
Program: Decontamination and Decommissioning
OPS Office/Site: Richland Operations Office/Hanford Site
PBS No.: RL-RC01
Waste Stream: Characterization of MLLW debris (ER-01, risk = 4 & ER-02, risk = 4) and HAZ debris (ER-06, risk = 4 & ER-08, risk = 4)
TSD Title: N/A
Waste Management Unit (if applicable): N/A
Facility: Reactors 105-D and 105-H

Priority Rating: This entry addresses the Accelerated Cleanup: Paths to Closure (ACPC) Priority:

____ 1. Critical to the success of the ACPC
_X_ 2. Provides substantial benefit to ACPC projects (e.g., moderate to high lifecycle cost savings or risk reduction, increased likelihood of compliance, increased assurance to avoid schedule delays)
____ 3. Provides opportunities for significant, but lower cost savings or risk reduction, and may reduce uncertainty in ACPC project success.

Need Title: Field screening for hazardous materials for the 105-D and 105-H reactors.

Need/Opportunity Category: *Technology opportunity* - the project desires an alternative to the current or planned baseline technology/process (i.e., a baseline exists but can be improved).

Need Description: A better field and/or in situ screening method is needed for detecting, quantifying and locating hazardous materials so that regulatory limits may be verified for material to be left in place, and so that waste may be segregated as required based on waste disposal criteria. The main hazardous contaminants of concern are RCRA metals, PCBs and sodium dichromate.

Schedule Requirements:
Earliest Date Required: 10/01/2001
Latest Date Required: 9/30/2003

Problem Description: Characterization of structures and material to be left in place is required to verify regulatory limits have been met. Currently, below grade structures must be sampled to verify limits have been met. Such sampling requires sampling under the below grade structures, which is time consuming and costly.

Also, waste material must be segregated into hazardous, mixed and low level waste streams. The current method of segregation is to first create the waste through D&D, package the waste, sample the waste, send the sample to a laboratory, wait two to three weeks and then segregate the waste according to the results. This is a time consuming process and is inefficient in that not all material is tested, only the samples. Therefore, an entire drum of material may be treated as mixed or hazardous based on a few samples. An in situ method would allow operators to identify hazardous and mixed material prior to mixing with material that is clean or only radioactively contaminated. Such a method would save costs by reducing the amount of mixed and hazardous waste, by reducing lab requirements, by reducing waste handling, and by reducing the wait time. Such a method would also reduce human error involved in sampling, record keeping, laboratory analysis, laboratory reporting, multiple waste handling, etc.

Benefit to the Project Baseline of Filling Need: Such a method would save costs by reducing the work required to verify regulatory limits have been met for material left in place, reducing the amount of mixed and hazardous waste, reducing lab requirements, reducing waste handling, and reducing the wait time.

Functional Performance Requirements: A near real-time, in situ method is needed to detect, quantify and locate RCRA metals, PCBs and sodium dichromate to regulatory criteria. Any method should be applicable to below grade concrete structures to determine if they must be remediated or to verify regulatory limits have been met for leaving in place. Analysis methods that are not in situ but that can be applied in the field may be acceptable if they provide quick turnaround (less than two days). The method would be used on construction materials and any items within or under the facilities.

WBS No.	***TIP No***.
1.4.03.1.1.05.06.02.05.42.10 and 1.4.03.1.1.04.06.02.08.42.10	N/A

Relevant PBS Milestone: PBS-MC-031

Justification for Need:

Technical: Characterization information is needed to verify regulatory limits have been met for material to be left in place and to properly segregate waste. Quicker methods involving less handling will result in lower cost, less error and the ability to classify material in situ.

Regulatory: Waste classification is needed to verify regulatory limits have been met, to segregate waste, and meet waste disposal requirements.

Environmental Safety & Health: Verification that material left in place meets regulatory requirements and proper segregation of waste helps to ensure environmental safety and health.

Cost Savings Potential (Mortgage Reduction): Rough order of magnitude (ROM) life cycle cost (LCC) savings of $700K. LCC savings estimate is based on the assumption that 1% of

the last year's project costs for 105-F and 105-DR could have been realized and that similar savings would be realized on the other 5 reactors that will be put into interim safe storage. Project costs of $14.4M for 105-F and $14M at 105-DR (from the Estimate at Completion that is updated annually by Project Controls) was used. Such a method would save costs by reducing the work required to verify regulatory limits have been met for material left in place, reducing the amount of mixed and hazardous waste, reducing lab requirements, reducing waste handling, and reducing the wait time.

Cultural/Stakeholder Concerns: Stakeholders are concerned that material left in place meets regulatory limits and that waste is handled properly.

Other: None identified.

Current Baseline Technology: The current method of collecting and sending samples to laboratories results in a turnaround time of two to three weeks. Also, one must dig or drill under the below grade structures in order to get samples.

End User: Environmental Restoration Project

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